

20°. Lafayette, Ind., aurora flashing up in the north to a height of 30°, resembling faint sheet lightning. The display of the 8th was reported by the following stations: Eastport, Me., from 9.30 to 11.30 p. m., faint aurora appeared in northern horizon, altitude 15°, color, very faint bluish white. Orono, Me., during the evening. Dexter, Me., bright arch. Gardiner, Me., 9.15 to 11.15 p. m., faint aurora. Burlington, Vt., 7 to 11 p. m., faint aurora; no prominent features. Woodstock, Vt., 9 p. m., faint nebulous light rising 15° or 20° above the horizon. Harvard College, Cambridge, Mass., fine aurora with streamers in the evening; traces visible at 11 p. m. North Volney, N. Y., 9 p. m., brilliant streamers. Ithaca, N. Y., faint auroral light, no striking features. Friendship, N. Y., during the evening. Waterburg, N. Y., 9 p. m., diffuse light in the north, some faint streamers. Toronto, Can., during the evening. Fort Brady, Mich., 9 p. m. Alpena, Mich., 8 to 11.25 p. m., consisting of a diffuse light without streamers. Northport, Mich., 8.20 p. m., consisting of arch of 15° altitude, most brilliant in the northeast. New Corydon, Ind., 5 a. m. St. Vincent, Minn., from 7.30 to 9 p. m., several beams of light extended to a height of from 7° to 10°, but owing to a bank of stratus clouds along the northern horizon, their brilliancy and characteristics were indistinct. Bismarck, Dak., 9 to 11 p. m., appeared as a nebulous light, elevation about 8°. The display of the 5th, was reported by the following stations: New Shoreham, R. I., 7.50 to 9 p. m., faint aurora in the form of an arch, about 15° above the northern horizon and 8° in width. Southington, Conn., 8 p. m. Marquette, Mich., 7.15 to 7.35 p. m., faint aurora. Manitowoc, Wis., during the evening. New Corydon, Ind., 6.30 to 7 p. m., bright white segment, altitude 10°, extension 60°. Riley, Ill., 7.30 p. m., arch 4° broad, altitude 12°; disappeared before 9 p. m. Elmira, Ill., from 7 to 8 p. m. Cresco, Ia., 6.30 to 6.45 p. m., faint aurora; patches of light, forming portions of an arch, and constantly shifting. St. Paul, Minn., 9 p. m., until after midnight; diffuse light of pale yellow, changing to bright orange and pale green; at 11 p. m., there was a well defined arch 15° above northern horizon, from which slender luminous columns shot up towards the zenith with a wavy motion from left to right; they resembled merry dancers. The display of the 6th was reported by the following stations: Dexter, Me., during the evening. Newport, Vt., during the evening. Buffalo, 1.45 a. m., became visible during temporary break in the clouds; it was observed for $\frac{1}{2}$ hour, no well defined arch was formed, it being broken and consisting of numerous bright beams, some extending to an altitude of 30°. Its horizontal limit was from NW. to NE. and was about 8° above the horizon. The whole display had a slight movement from W. to E. Cleveland, O., 11 to 11.30 p. m., diffuse light of straw color; no streamers. Milwaukee, 1 a. m., diffuse light. The following isolated displays were reported: Eastport, Me., 23d, 11 p. m., to midnight, extending from NW. to NE., and to an altitude of 30°. It was so nearly obscured by clouds that no peculiarities were detected. Gardiner, Me., 18th, low diffuse arch; not visible until after 9 p. m. Harvard College, Cambridge, Mass., 11th, 11.30 p. m., faint trace of aurora low down in the north. New York, 28th, 7 p. m., faint aurora, visible until 7.50 p. m., when the sky became obscured by clouds. It appeared as a horizontal light and was characterized by recurring fits of brilliancy; its color was at first, a pale red and later, a bright red. It appeared about 20° E. of N, covering 20° azimuth, and extended about 20° above the horizon; its centre or crown extended upward about 30°. Catawissa, Pa., 18th. Toronto, Can., 9th. Lansing, Mich., 9th. New Corydon, Ind., 10th, 1 to 3 a. m., strong auroral light. Manitowoc, Wis., 9th, 9.30 p. m., with arch; 13th, 11 p. m., with arch. Embarrass, Wis., 12th, 8.30 p. m., faint aurora. Beloit, Wis., 9th. Cresco, Ia., 10th, midnight, faint light in horizontal lines from NW. to NE., probably an aurora. Clinton, Ia., 9th, from early evening till 9 p. m.; it presented the beams usually seen, with a wavy motion. Monticello, Ia., 19th, 10 p. m. Clay Centre,

Kan., 22d, 10 p. m. St. Vincent, Minn., 7th, 8 to 10 p. m., pale diffuse light; 9th, 7 to 10 p. m., brilliant light of greenish color with beams resembling merry dancers; altitude 6° to 15°. Ft. Stevenson, Dak., 12th, 8 to 8.45 p. m., 2 arches, parallel to each other. Ft. Assinnaboine, Mont., 20th, first seen at 4 a. m. and ended at 7 a. m.; observed again in the evening, and remained visible until obscured by clouds at 11 p. m.; at 10 p. m., beautiful streamers in large numbers shot upward to a height of 45°, appearing and disappearing in rapid succession. Both auroras extended from NNW. to ENE., azimuth 45°; altitude 25°. Ft. Benton, Mont., 18th, 9 p. m.; 19th, 9 p. m.

Thunder Storms.—They were reported in the various districts on the following dates: New England, 21st; Middle Atlantic States, 21st, 28th; South Atlantic States, 4th, 8th, 9th, 14th, 18th, 21st, 28th; Florida Peninsula, 9th, 28th; East Gulf States, 3d, 8th, 15th, 27th, 28th; West Gulf States, 2d, 3d, 7th, 8th, 12th, 14th, 15th, 19th, 20th, 24th, 25th to 28th; Rio Grande Valley, 2d, 19th, 27th; Ohio Valley and Tennessee, 8th, 12th, 16th to 21st, 23d, 27th, 28th; Lower Lake Region, Hudson, Ohio, 19th; Upper Lake Region, Kalamazoo, Mich., 12th, 13th; Upper Mississippi Valley, 12th, 13th, 16th to 20th, 27th, 28th; Missouri Valley, 7th, 12th, 16th to 21st, 24th to 28th; Middle Slope, 7th, 8th, 12th, 15th, 16th, 19th, 20th, 27th, 28th; Southern Plateau, La Mesilla, N. M., 2d.

Telegraphic Communication interfered with by Atmospheric Electricity.—Chincoteague, Va., 28th, kept up a continuous rattle for about two hours. Ft. Supply, Ind. Ty., 19th, during a. m. showers of sparks shot across the switch-board. Ft. Reno, Ind. Ty., 19th.

OPTICAL PHENOMENA.

Solar halos have been observed in the various districts on the following dates: New England, 4th, 5th, 9th, 15th, 16th, 17th, 20th, 23d, 25th, 26th; Middle Atlantic States, 1st, 2d, 3d, 7th, 8th, 11th to 14th, 16th, 17th, 25th, 26th; South Atlantic States, 2d, 13th, 25th, 26th; Florida Peninsula, Cedar Keys, 19th; Ohio Valley and Tennessee, 1st, 3d, 4th, 6th to 11th, 13th to 19th, 25th, 26th, 28th; Lower Lake Region, 6th to 9th, 11th, 15th, 25th to 28th; Upper Lake Region, 1st, 2d, 4th, 6th, 11th, 12th, 17th, 19th, 22d, 24th; Extreme Northwest, 1st, 6th, 16th, 23d; Upper Mississippi Valley, 3d, 4th, 6th, 8th, 10th, 12th, 14th, 15th, 17th, 18th, 19th, 21st, 22d; Missouri Valley, 3d, 4th, 10th to 15th, 24th, 25th, 28th; Northern Slope, Ft. Assinnaboine, 15th; Middle Slope, 3d, 6th, 10th, 12th, 14th, 24th, 27th; Northern Plateau, Umatilla, Or., 3d, and Dayton, Wash. Ty., 17th; Middle Pacific Coast Region, 1st, 2d, 3d, 9th, 15th, 23d, 24th, 26th; South Pacific Coast Region, 5th, 7th, 27th.

Lunar halos have been observed in the various districts on the following dates: New England, 1st, 2d, 3d, 5th, 20th, 23rd, 25th, 26th; Middle Atlantic States, 1st to 7th, 24th, 25th, 26th; South Atlantic States, 7th, 11th, 20th, 25th to 28th; Florida Peninsula, 2d, 3d, 25th, 28th; East Gulf States, 1st, 7th, 24th, 26th; West Gulf States, 1st, 11th, 23d, 26th; Rio Grande Valley, Eagle Pass, 27th; Ohio Valley and Tennessee, 1st to 4th, 6th, 7th, 8th, 11th, 24th to 28th; Lower Lake Region, 1st to 7th, 24th to 27th; Upper Lake Region, 1st, 3d, 4th, 24th, 25th, 27th, 28th; Extreme Northwest, 1st, 5th, 23d, 24th, 26th, 27th, 28th; Upper Mississippi Valley, 1st, 2d, 3d, 7th, 8th, 9th, 13th, 21st, 24th, 26th, 28th; Missouri Valley, 1st, 2d, 4th, 6th, 8th, 10th, 24th, 25th, 26th, 28th; Northern Slope, 1st, 2d, 22d to 26th, 28th; Middle Slope, 3d, 5th, 24th, 25th, 27th, 28th; Southern Slope, 6th, 26th, 27th; Southern Plateau, 3d, 4th, 5th, 8th to 11th, 23d, 24th, 25th, 27th; Middle Plateau, 5th, 23d to 26th; Northern Plateau, 1st, 22d, 23d, 28th; North Pacific Coast Region, Olympia, Wash. Ty., 3d, and Roseburg, Or., 2d; Middle Pacific Coast Region, 3d, 4th, 5th, 15th, 16th, 20th, 26th; South Pacific Coast Region, 3d, 4th, 5th, 23d, 24th.

Mirage.—Indianola, Tex., 4th, 8th, 9th. Huron, Dak., from 7 to 8.30 p. m., "making the plains, which were covered with snow, appear like vast perpendicular walls with horizontal tops."